SUBJECT REQUIREMENT	LOCATION IN APPLICATION COMMENTS

PART D PROCESS INFORMATION
 	
This part should include details of (1) the storage and/or treatment process(s), and (2) each hazardous waste unit to be utilized for these processes. Provide the technical design calculations, drawings and specifications for every process and unit. All design information submitted must be certified by a professional engineer registered in the Commonwealth of Kentucky.
 	
D-2 <u>Tanks Systems</u> 401 KAR 34:190 and 401 KAR 38:160
Description of:
• Number, location and type(s) of tanks (i.e. aboveground, underground etc. based on the regulatory definitions in 34:005)
• Procedures for handling incompatible, ignitable, or reactive wastes, including the use of buffer zones. If buffer zones are employed, provide a description of them and their operation and identify wastes to be buffered.
• For each tank,
  • Material of construction, volume, dimensions and all design details
  • Type of waste contained in tanks
  • Operating pressure and temperature.
 	
D-2a <u>Existing Tank System</u>
 	
D-2a(1) <u>Assessment of Existing Tank Systems' Integrity</u> 401 KAR 34:190 Section 2
Provide a written assessment, reviewed and certified by an independent, qualified, registered professional engineer, on the structural integrity and suitability of each tank system for handling hazardous waste which includes:
• Design standard(s), according to which the tank and ancillary equipment were constructed.
• Hazardous characteristics of the wastes that have been and will be handled.
• Existing corrosion protection measures.
• Documented age of the tank system or an estimate.
• Results of a leak test, internal inspection, or other tank integrity examination.
 	
D-2a(2) <u>External Corrosion Protection</u>
 	
Specify type and, as appropriate, location of external corrosion protection measures used to ensure continued structural integrity and suitability of each tank system for handling hazardous waste.	

SUBJECT REQUIREMENT	LOCATION IN APPLICATION COMMENTS

D-2b <u>New Tank Systems</u>
 	
**D-2b(1) <u>Assessment of New Tank System's Integrity</u>
401 KAR 34:190 Section 3(1)**
 	
Provide a written assessment ,reviewed and certified by an independent, qualified, registered professional engineer, on the structural integrity and suitability of each tank system for handling hazardous waste. The assessment must show that the foundation, structural support, seams, connections and pressure controls (if applicable) are adequately designed and that the tank system has sufficient structural strength and compatibility with the waste(s) to be stored or treated to ensure that it will not collapse, rupture, or fail.
 	
This assessment includes at a minimum:
 	
• Design standards(s) according to which tank(s) and/or the ancillary equipment are constructed.
• Hazardous characteristics of the waste(s) to be handled.
• Corrosion assessment by a qualified expert for new tank systems or components in which the external shell of a metal tank or any external metal component of the tank system will be in contact with the soil or with water. Include factors such as:
  • soil moisture content
  • soil pH
  • soil sulfides level
  • soil resistivity
  • structure to soil potential
  • influence of nearby underground metal structures (e.g., piping)
  • existence of stray electric current
  • existing corrosion protection measures
  The type and degree of external corrosion protection should consist of one or more of the following:
  • corrosion-resistant materials of construction
  • corrosion-resistant coating with cathodic protection
  • electrical isolation devices
• Determination of design or operation measures that will protect underground tank systems against potential damage due to vehicular traffic.
• Design considerations to ensure that tank foundations will maintain the load of a full tank and that tank systems will be anchored to prevent flotation or dislodgement where the tank system is placed in a saturated zone or is located within a seismic fault zone. Include design considerations to ensure that tank systems will withstand the effects of frost heave.	

SUBJECT REQUIREMENT	LOCATION IN APPLICATION COMMENTS
D-2b(2) <u>External Corrosion Protection</u> Describe the design, construction, and operation of corrosion protection systems necessary to ensure the integrity of the tank system. State that any field-fabricated corrosion protection system will be supervised by an independent corrosion expert. **D-2b(3) <u>Description of Tank System Installation and Testing Plans and Procedures</u> 401 KAR 34:190 Section 3** Demonstrate that an independent, qualified installation inspector or an independent, qualified registered professional engineer will inspect each new tank system prior to covering, enclosing, or placing a new tank system or component in use. Inspection should determine the presence of: • weld breaks • punctures • scrapes of protective coatings • cracks • corrosion • other structural damage or inadequate construction/installation. Specify how all discrepancies will be repaired. New tank systems or components that are placed underground and that are backfilled must be provided with a back-fill material that is a non-corrosive, porous, homogeneous substance and that is installed so that the backfill is placed completely around the tank and compacted to ensure that the tank and piping are fully and uniformly supported. New tanks and ancillary equipment will be tested for tightness prior to being covered, enclosed, or placed in use. Repair procedures must be specified if the tank system is found not to be tight. Ancillary equipment will be supported and protected against physical damage and excessive stress due to settlement, vibration, expansion, or contraction. **D-2c <u>Dimensions and Capacity of Each Tank</u> 401 KAR 38:160 Section 2** Tank dimensions and capacity. **D-2d <u>Description of Feed Systems, Safety Cutoff, Bypass Systems and Pressure Controls</u>** Description of the feed systems, safety cutoff, bypass systems, and pressure controls. **D-2e <u>Diagram of Piping, Instrumentation and Process Flow</u>** Diagram of piping, instrumentation and process flow for each tank system.	

SUBJECT REQUIREMENT	LOCATION IN APPLICATION COMMENTS
D-2f Containment and Detection of Releases **401 KAR 34:190 Section 4** **D-2f(1) Plans and Description of the Design, Construction, and Operation of the Secondary Containment System** The following information must be provided for the secondary containment system: • Age of all existing tank systems. If the age of a tank system cannot be determined, indicate the reason. • Design, installation and operation to prevent any migration of waste or accumulated liquid from the tank system to the soil, groundwater, or surface water at any time during its use. • Materials of construction used to construct or line the system. • Proof that the materials are compatible with the wastes in the tank system. • System has sufficient strength and thickness to prevent failure caused by any of the following: 1. pressure gradients (including static head and external hydrological forces) 2. physical contact with the wastes 3. climatic conditions 4. stress of daily operation (including stresses from nearby vehicular traffic) • Calculations to prove that it is placed on a foundation or base that is capable of providing support, resisting pressure gradients above and below the system, and preventing failure due to settlement, compression, or uplift. • Description of the leak detection system, including its operating principle, design features and operating procedures. • Demonstration that the leak detection system will detect the failure of either the primary or secondary containment structure or the presence of any release of hazardous waste or accumulated liquid in the secondary containment system within 24 hours. If the prevailing site conditions or detection technologies will not allow detection of a release within 24 hours, then specify the earliest practical time that detection can take place. Explain why this longer period does not pose a threat to human health and the environment. • Show how the secondary containment system is sloped or otherwise designed or operated to drain and remove liquids resulting from leaks, spills, or precipitation. • Document how it will be ensured that spilled or leaked wastes and precipitation will be removed from the secondary containment system within 24 hours. If wastes and precipitation cannot be removed within 24 hours, then specify the earliest practical time that removal can take place. Indicate why this longer period does not pose a threat to human health and the environment.	

SUBJECT REQUIREMENT	LOCATION IN APPLICATION COMMENTS
D-2f(2) **Requirements for External Liner, Vault, Double-Walled Tank or Equivalent Device: 401 KAR 34:190 Section 4(4)&(5)** Secondary containment for each tank must include at least : a liner external to the tank, a vault, a double-walled tank, or an equivalent device approved by the Division Director. The following design and operation procedures should be given for each device: **External liner system**: • Calculations to show that it contains 100 percent of the capacity of the largest tank within its boundary. • Run-on or infiltration of precipitation is prevented. Alternatively, show that the collection system has sufficient excess capacity to contain run-on and precipitation from a 25-year, 24-hour rainfall. • Free of cracks or gaps. • System surrounds the tank completely and covers all surrounding soil likely to come in contact with the wastes if they were released from the tank(s) **Vault System**: • Calculations to show that it contains 100 percent of the capacity of the largest tank within its boundary. • Designed or operated to prevent run-on or infiltration of precipitation. Alternatively, show that the collection system has sufficient excess capacity to contain run-on and precipitation from a 25- year, 24-hour rainfall. • Constructed using chemical-resistant, water impermeable interior coating or lining, that is compatible with the stored waste and that will prevent migration of waste into the vault material. Specify coating or lining used, and provide the manufacturer's data sheet. • Constructed using chemical-resistant water stops in place at any joints. Specify the material used. • Method used to protect against the formation and ignition of vapors placed in the tank(s) if the wastes are ignitable or reactive. • Exterior moisture barrier used, and provide the manufacturer's data sheet. Alternatively describe how the vault is designed or operated to prevent the migration of moisture into the vault if the vault is subject to hydraulic pressure. **Double-walled tank**: • An integral structure so that any release from the inner tank is contained by the outer shell • If the unit is metallic, specify the type(s) of corrosion protection used for both the internal and external shell.	

SUBJECT REQUIREMENT	LOCATION IN APPLICATION COMMENTS
• Description of the leak detection system. It must be a continuously operating unit, capable of detecting a release within 24 hours. If the prevailing site conditions or detection technologies will not allow detection of a release within 24 hours, must specify the earliest practical time that detection can take place and indicate why this longer period does not pose a threat to human health and environment. **D-2f(3) <u>Secondary Containment and Leak Detection Requirements for Ancillary Equipment:</u> 401 KAR 34:190 Section 4(6)** Each tank system's ancillary equipment must be provided with secondary containment such as jacketing, or a double-wall that has been (will be) designed, installed and operated to prevent any migration of waste or accumulated liquid to the solid, groundwater, or surface water at any time during its use. Also, demonstrate that the containment system can detect, collect and contain potential releases and accumulated liquids. This demonstration must include at least the following: • Materials of construction used to construct or line the system. Show that these materials are compatible with the wastes in the tank system. • Demonstrate that the system has sufficient strength and thickness for any of the following: 1. pressure gradients (including static head external hydrological forces) 2. Physical contact with the wastes 3. Climatic conditions 4. Stress of daily operation (including stresses from nearby vehicular traffic). • Calculations proving that the secondary containment system is placed on a foundation or base that is capable of providing support, resisting pressure gradients above and below the system, and preventing failure due to settlement, compression, or uplift. • Description of the leak detection system, including its operating principle, design features and operating procedures. The leak detection system must detect the failure of either the primary of secondary containment structure or the presence of any release of hazardous waste or accumulated liquid in the secondary containment system within 24 hours. If the prevailing site conditions or detection technologies will not allow detection of a release with 24 hours, then specify the earliest practical time that detection can take place. Indicate why this longer period does not pose a threat to human health and the environment. • Secondary containment system must be sloped or otherwise designed or operated to drain and remove liquids resulting from leaks, spills, or precipitation.	

SUBJECT REQUIREMENT	LOCATION IN APPLICATION COMMENTS
• Document how it will be ensured that spilled or leaked wastes and precipitation will be removed from the secondary containment system within 24 hours. If wastes and precipitation cannot be removed within 24 hours, then specify the earliest practical time that removal can take place. Indicate why this longer period does not pose a threat to human health and the environment. The demonstration required above need not be made for: 1. Above ground piping (exclusive or flanges, joints, valves, and other connections) that are visually inspected daily. 2. Welded flanges, joints, and connections that are visually inspected daily. 3. Seal-less or magnetic coupling pumps that are visually inspected daily, and 4. Pressurized above ground piping systems with automatic shut-off devices that are visually inspected daily. **D-2f(4) <u>Requirements for Existing Tank Systems Until Secondary Containment is Implemented:</u> 401 KAR 34:190 Section 4(9)** Provide the following: **Non-enterable underground tanks**: Results of a leak test (or other tank integrity test approved by the Cabinet). Procedures to be repeated at least annually until secondary containment is provided. **Other than non-enterable underground tanks**: Results of a leak test or present a schedule and procedures for assessing the overall condition of the tank system by an independent, qualified registered professional engineer until secondary containment is provided. **Ancillary equipment**: Results of a leak test (or other integrity assessment measures approved by the Cabinet). Indicate the procedures that will be used to ensure that such tests will be repeated at least annually until secondary containment is provided. **Maintenance of a Record** per 34:190 Section 4(9)(e) **Tank systems/components that fail the leak test or assessment** must demonstrate compliance with 34:190 Section 7. **D-2f(5) <u>Variance from Secondary Containment</u> 401 KAR 34:190 Section 4(7)** Provide information for one of the following alternatives:	

SUBJECT REQUIREMENT	LOCATION IN APPLICATION COMMENTS
• **Technology-based variances**: detailed plans and engineering and hydrogeologic reports, as appropriate, describing alternate design and operating practices that will, in conjunction with location aspects, prevent the migration of any hazardous waste or hazardous constituents into the groundwater or surface water during the life of the facility. • **Risk-based variances**: detailed demonstration that no substantial present or potential hazards will be posed to human health or the environment, should a release enter the environment. • Demonstration that tanks used to store or treat hazardous waste contain **no free liquids** as defined by the Paint Filter Test and that such tanks are situated inside a building with an impermeable floor.	
D-2g **<u>Controls and Practices to Prevent Spills and Overflows:</u>** **401 KAR 34:190 Sections 5 and 6** Provide adequate information to ensure that the hazardous wastes or treatment reagents placed in a tank system will not cause any element of that system to rupture, leak, corrode or otherwise fail. Provide detailed description of controls and practices used to prevent spills and overflows. Include at a minimum: • Spill prevention controls (e.g., check valves, dry disconnect couplings) • Overfill prevention controls (e.g., level sensing devices, high level alarms, automatic feed cutoff, or bypass to standby tank) • Maintenance of sufficient freeboard in uncovered tanks to prevent overtopping by wave or wind action or by precipitation. Provide detailed plans for the schedule and procedure for inspecting: • Overfill controls • Aboveground portions of the tank system • Data from monitoring and leak detection equipment • Construction materials and the area immediately surrounding the externally accessible portion of the entire tank system • Cathodic protection system	
D-2h **<u>Special Requirements for Hazardous Wastes F020,F021, F022 F023, F026,and F027 in Existing Tanks</u>** Documentation of compliance with 401 KAR 34:190 Section 4(1)	